AGU 100 ADVANCING EARTH AND SPACE SCIENCE FALL MEETING Washington, D.C. | 10–14 Dec 2018

PP23D-1524: Disentangling local and regional climatic controls on vegetation and the flood pulse in the Pantanal, the world's largest tropical wetland

Tuesday, 11 December 2018
13:40 - 18:00
Walter E Washington Convention Center - Hall A-C (Poster Hall)

Tropical wetlands provide valuable ecosystem services and are critically involved in the global carbon cycle. Future changes in rainfall may disrupt these processes and therefore the maintenance of these aquatic landscapes. Further, land-use change is likely to result in modifications to the landscape via dam construction, agriculture, and ranching that may damage wetland functioning and lead to terrestrialization. The Pantanal, South America, is the largest wetland in the world as a consequence of flooding along the Upper Paraguay River creating a series of floodplain lakes and backwaters which have been used as paleoclimatic archives. An in depth understanding of the modern relationships between vegetation, water resources, and climate are critical to developing long term records of hydroclimatic change in the Pantanal as well as for quantifying future change. However, this is problematic due to a complex drainage network, which leads to a disconnect between seasonal rainfall timing and the timing of the flood pulse along the Paraguay River, which may be offset by many months. We use high resolution remote sensing data of vegetation and climate paired with *in situ* measurements of river stage to conduct spatial analysis to disentangle the linkages among the rains, flooding, and terrestrial vegetation. Although seasonal rainfall timing is coeval throughout the basin, vegetation leaf out and productivity depends on relative position along inundated areas. During a single season, vegetation greening occurs immediately following the inception of the rainy season away from streams/rivers; however, along channels and lakes, greening may lag rainfall by as much as six months. Further, vegetation in flooded areas responds more closely to timing of measured river stage along channels. Finally, inter-annual rainfall variability also impacts vegetation differently near flooded areas, with a weaker and longer lagged response to changes in rainfall magnitude, likely due to local water storage thresholds. This work suggests that the importance of local storage and flood pulse timing for seasonal and interannual vegetation productivity in inundated areas within the Pantanal, which means that local geomorphic conditions may be the strongest controls on biogeochemical processes in this large wetland.

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